DOCUMENT RESUME

ED 199 925 EA 013 444

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TITLE The Relationship Between School Climate and Implementation of an Innovation in Elementary Schools.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Individualized Schooling.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
REPORT NO WRDCIS-TP-89
PUB DATE Nov 80
CONTRACT OB-NIE-G-80-0117
NOTE 49p.; Report from the Project on Studies of the Implementation of Individualized Schooling. Appendix A may reproduce poorly due to broken print of original document.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Educational Change; *Educational Environment; *Educational Innovation; Educational Research; Elementary Education; Questionnaires; *Teacher Attitudes
IDENTIFIERS *Individually Guided Education; *Profile of a School; *Wisconsin

ABSTRACT

As part of a larger project on studies of implementation, specifically of Individually Guided Education (IGE), this paper describes the preliminary results of research on school climate, an important factor in retarding or promoting change. A review of the literature on school climate includes a description of Likert and Likert's Profile of a School. During on-site visits to the sample of 10 Wisconsin schools in the project, the researchers administered a modification of the Likert instrument to teachers in the fall of 1978 and the spring of 1979. The resulting data indicate that the climates in the sample schools were perceived to be increasingly open during the study and that teachers with more experience in IGE schools tend to perceive school climate as more open while teachers employed longer in a particular school tend to perceive school climate as less open. The authors suggest that using a school as its own control may prove more profitable for research on climate than previous approaches that have used climate measures to distinguish between schools or have used post hoc data to attempt to predict the receptivity of particular types of schools to innovation. (Author/WD)

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Theoretical Paper No. 89

THE RELATIONSHIP BETWEEN SCHOOL CLIMATE AND IMPLEMENTATION OF AN INNOVATION IN ELEMENTARY SCHOOLS

by

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Report from the Project on
Studies of the Implementation of Individualized Schooling

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EA 013 444

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Madison, Wisconsin

November 1980

Published by the Wisconsin Research and Development Center for Individualized Schooling. The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Grant No. OB-NIE-G-80-0117

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- conducting and synthesizing research to clarify the processes of school-age children's learning and development
- conducting and synthesizing research to clarify effective approaches to teaching students basic skills and concepts
- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

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Abstract

The Wisconsin Research and Development Center for Individualized Schooling's project Studies of Implementation sought to identify factors that retard or promote change by tracking the adoption and implementation of Individually Guided Education in 10 elementary schools in Wisconsin. One factor which review of the literature on change indicated to be of particular importance is school climate. This paper reports the project's preliminary research on school climate.

The paper begins with a review of research on school climate. Descriptions of Halpin and Croft's Organizational Climate Description Questionnaire and Likert and Likert's Profile of a School, two of the most commonly used instruments for assessing school climate, are included. Several studies which used these instruments for research on the relationship between climate and change in schools are summarized.

Following a description of the sample, instrumentation, and design used in this study, data related to school climate in the 10 sample schools are reported. Statistical analysis showed a significant difference in the climates of the 10 schools between the first and second administrations of the instrument. Stepwise regression indicated that a significant amount of the variance in the change in the perceptions of teachers could be accounted for by two variables: the amount of teaching experience a teacher had with IGE and the length of time a teacher had been employed within an IGE school.

The paper concludes with some suggestions for future research on the relationship between school climate and change. Specifically, the

researchers recommend that researchers use a school as its own control and track changes in the perceived climate of a particular school over the life of an innovation.

The Wisconsin Research and Development Center for Individualized Schooling's project Studies of Implementation is a 3-year longitudinal investigation of planned change in selected elementary schools. Specifically, the study seeks to identify factors or conditions that promote or retard change by tracking the adoption and implementation of Individually Guided Education (IGE) in 10 elementary schools in Wisconsin. These schools were selected by stratified random sampling to reflect varying years as IGE schools, urban and nonurban settings, and the use of the Center's reading and mathematics curricular products. A complete description of the project, rationale for using IGE as the innovation under consideration, details of the site selection process, and descriptions of the sites for the study are available in other project publications (Davis, Klenke, & Barrows, Note 1; Barrows, Klenke, & Heffernan, Note 2).

The literature on planned change in educational settings suggests that organizational climate is a key factor in the adoption and implementation of an innovation. Berman and McLaughlin conclude from studies on the implementation of federal policies conducted for the Rand Corporation (1976) that school climate is of primary importance: "...the local organizational climate and the motivations of project participants had major effects on perceived success and on change in teacher behavior" (p. 361). Fullan and Pomfret (1977) adopt this position when reporting their research on the implementation of educational changes: "Several studies suggest that the existing 'organizational climate' of adopting units plays a critical role in whether and how implementation occurs" (p. 383).

Because organizational climate is presumed to be a key factor in

the receptivity of an educational organization to change, collection of data on the organizational climates of the 10 Wisconsin schools was included in the Studies of Implementation project. Detailed description of the empirical data collected in three of the schools is included in Klenke and Barrows (Note 3). The purpose of this paper is to report the aggregated data on organizational climate and to test a major hypothesis about the relationship between change and organizational climate.

Review of the Literature on School Climate

Research on school climate has been conducted within the broader context of research on organizational climate. Three major reviews of the literature on organizational climate appeared in the mid-1970's (Hellriegel & Slocum, 1974; James & Jones, 1974; Payne & Pugh, 1976). These three articles were described at some length in a previous project document (Kasten, Note 4), and several limitations to present methods of measuring organizational climate were noted. The reader interested in the broader framework within which research on climate in educational institutions has been conducted is referred to that document. Of particular relevance to this paper is the literature specifically related to the measurement of school climate and to the relationship between climate and change in educational institutions.

The beginning for research on school climate is the sense that there is something about a particular school that distinguishes it from all other schools, even schools with similar designs and purposes. Definitions of school climate are generally related to definitions from general organizational theory. Sergiovanni and Starratt (1979), for example,

base their definition on that in Litwin and Stringer's book Motivation and Organizational Climate. Climate is:

> . . . a combination of enduring characteristics which describe a particular school and distinguish it from other schools, and the feeling which teacher and student have for that school. Accordingly, climate represents a composite of mediating variables which intervene between initiating and school effectiveness variables. (p. 96)

Climate, in other words, is what makes the feel of a particular school unique. Hoy and Miskel (1978) also emphasize this uniqueness: "The set of internal characteristics that distinguish one school from another and influences the behavior of people in it is called the organizational climate" (p. 137). Hoy and Miskel appear to see climate as the aggregate of individuals' beliefs:

> The climate is the end product of the school groups--students, teachers, administrators--as they work to balance the organizational and individual dimensions of a social system. These products include shared values, social beliefs, and social standards. (p. 137)

Descriptions of what organizational variables can properly be assigned to the school climate vary less than similar descriptions for organizational climate. This can be seen by comparing the two climate instruments that have been used most extensively for research in schools, the Organizational Climate Description Questionnaire (OCDQ) by Halpin and Croft (1963) and the Profile of a School (POS) by Likert (1977), an adaptation of the Profile of Organizational Characteristics. Both use limited approaches to school climate.

Halpin and Croft are candid about the limitations of their definition:

> We recognized when we had first proposed this study that among the numerous factors which could be conceived as defining the Climate of a school, the following--at the very least--would need to be taken into account: the socioeconomic status of the school's patrons; the

> biographical and personality characteristics of the principal and the teachers; the 'quality' of the students; the attitudes of the parents toward the school; the school's physical plant; the teachers' salary schedule; the educational and administrative policies of the school district; the location [in the system, geographic location, and urban or rural setting] of the school; and, of prime importance for the present phase of the study, the social interactions that occur between the teachers and the principal. We knew that we could not handle all of these facets simultaneously. Yet we had to start somewhere. So we chose to limit the scope of the present study to descriptions made of the school primarily in terms of teacher-principal relationships. (p. 7)

These limitations are important. The climate construct, as defined by Halpin and Croft, treats only one aspect of relationships within a school, though the relationship is seen as the key in many analyses of school social systems. Not only is this limitation important, but later discussions and applications of the OCDQ have frequently lost sight of it and taken the OCDQ as a measure of the total climate of a school. Moreover, though many of the factors Halpin and Croft list as important parts of school climate and others they suggested later, such as the effect of the group on the leader, the school system as a context for the school, various other demographic features, and the "political flavor" of the community (Halpin, 1966, p. 201), could be assessed by objective measures, they chose to deal only with perceptual measures:

> We have assumed that how a leader <u>really</u> behaves is less important than how members of his group perceive that he behaves; it is their <u>perception</u> of his behavior that will determine the behavior of the group members, and will hence define the Organizational Climate. (Halpin & Croft, 1963, pp. 9-10; emphasis in the original)

Halpin and Croft see climate as assessable by aggregated individual perceptions: "We are satisfied to take the position that the faculty's

consensus in its perception of the school's climate can be used as a dependable index of what is 'out there'" (Halpin, 1966, p. 147). What is measured by the instrument, then, is not a nonobjective school climate, but the objective perceptions that organization members have of the school climate.

Descriptions of the OCDQ, the four factors which describe the behavior of the teachers, the four which describe the behavior of the principal, and the six profiles of organizations that additional factor analysis produced are available in many sources (see, for example, Halpin, 1966; Hoy & Miskel, 1978; Lipham & Hoeh, 1974; Sergiovanni & Starratt, 1979). The four factors that describe teacher behavior have been identified as follows:

1. Disengagement--teachers do not work well together.

2. Hindrance--the principal burdens teachers with unnecessary work.

3. Esprit--morale; social needs are satisfied and teachers have a sense of accomplishment about their work.

4. Intimacy--the teachers have friendly social relations.

Halpin (1966) notes that Esprit was chosen as the key subset for describing the school's climate. He adds, "We infer that high Esprit reflects an 'effective' balance between task-accomplishment and social-needs satisfaction" (p. 170). The four factors which describe principal behavior are the following:

5. Aloofness--the principal is formal and impersonal.

6. Production emphasis--the principal is directive, task-oriented, and closely supervises the staff.

7. Thrust--the principal motivates by his own example of hard work.

8. Consideration--the principal treats teachers humanely.

The crucial subfactor in this list is Thrust (Carver & Sergiovanni, 1969).

Later research on the OCDQ has questioned the validity of the instrument. Kenney and Rentz (1970), for example, tested the OCDQ in urban elementary schools and produced four significant factors rather than eight. Carver and Sergiovanni (1969) tested the OCDQ in secondary schools and concluded that:

> . . .opportunities for total staff teacher-teacher and teacher-principal interaction are so dramatically reduced, relatively, in large secondary schools that teachers are simply unable to check the 'most favorable' response to the items comprising these two subtests. Thus, low Esprit and Thrust scores are inevitable.... (p. 80)

This result might be avoided if the focus were shifted to a subunit within the school (see also Finlayson, 1973).

The six organizational profiles which emerged from the OCDQ exist on the following continuum: the open climate, the autonomous climate, the controlled climate, the familiar climate, the paternal climate, and the closed climate. The open climate is authentic and lively; leadership acts emerge from both the group and its leader. At the other end of the continuum is the closed climate, characterized by apathy, low morale, and inauthentic behavior. These climate profiles have been seriously questioned in subsequent research. Thomas (1976) reports virtually no support for these profiles as first outlined by Halpin and Croft (1963, p. 450). Given that, the implications in the following statement by Halpin (1966) are not to be taken lightly: "In a sense we did not discover these Organizational Climates, we <u>invented</u> them" (p. 138).

In summary, the OCDQ is one instrument that has been used extensively in research on school climate. Some problems with the OCDQ have been suggested, including the limited measure of school climate that the instrument uses and the inappropriateness of the instrument for use in secondary schools or even large elementary schools. These limitations must be remembered when assessing the results of research done with the OCDQ.

Likert's (1967) conception of organizational climate differs somewhat from that of Halpin and Croft (1963), though Hall (1972) found that the organizational models from which the two were developed are comparable. Likert sees climate as an intervening variable between what administrators do and organizational effectiveness (Sergiovanni & Starratt, 1979). Causal variables are subject to deliberate change by the organization and its management. These include structure, policies, strategies, and behavior (Likert, 1967). Intervening variables, on the other hand, cannot be altered directly by the management. These variables, Likert says, "reflect the internal state and health of the organization, e.g., the loyalties, attitudes, motivations, performance goals, and perceptions of all members and their collective capacity for effective interaction, communication, and decision making" (Likert, 1967, p. 29). End result variables are the dependent variables in Likert's conceptualization. Among them he lists performance and financial variables such as level of productivity, quality of product and service, level of costs, and current values of investments (Likert, 1967, pp. 228-229).

Likert reports that his Profile of Organizational Characteristics was initially devised to show the comparative differences among management

systems. Its use as a measure of the nature of the management system was recognized later (Likert, 1967). Likert's conception involves four different climates: System 1, exploitive-authoritarian; System 2, benevolent-authoritarian; System 3, consultative; and System 4, participative. Though the systems might be presumed to exist on a continuum similar to that for the six organizational profiles of Halpin and Croft (1963), Likert sees the four systems as more or less mutually exclusive:

> The communication processes of System 1 are compatible with all other aspects of System 1 but are not compatible with any aspect of System 3 or System 4. The same is true of the decision-making processes and the compensation plans. The management system of an organization must have compatible component parts if it is to function effectively. (Likert, 1967, p. 123)

System 4 is the ideal. As organizations move toward System 4 they ". . . are more productive, are characterized by high-performance work groups, have lower costs, have more favorable attitudes, and display improved labor-management relations . . ." (Sergiovanni & Starratt, 1979, p. 79).

Likert's approach focuses on the relationship between superior and subordinate as does Halpin and Croft's. Likert calls this relationship "crucial" and defines the basic principles of System 4 management in terms of the behavior of the supervisor:

1. the use by the manager or the principal of supportive relationships,
2. his use of group decision making, and
3. his high performance goals for the organization.

(Likert, 1967, p. 47)

As do Halpin and Croft, Likert measures climate by perceptions, specifically

the perceptions of subordinates:

> . . . it is essential to keep in mind that the interactions between the leader and the subordinates must be viewed in the light of the subordinate's background, values, and expectations. The subordinate's perception of the situation, rather than the supervisor's, determines whether or not the experience is supportive. (Likert, 1967, pp. 47-48)

Likert's Profile of a School is an adaptation of the Profile of Organizational Characteristics. It consists of 93 items with responses identified on an 8-point Likert scale. Likert's factor analysis of the items produces 38 indices, such as the following: support by the principal, teachers' openness regarding the principal, teacher frustration, student motivation, work facilitation by department head, and work facilitation by the principal.

Similarities between the OCDQ and the POS suggest that Likert's instrument is subject to some of the same limitations as the OCDQ: The conceptual boundaries of organizational and school climate as operationally established by the instrument are quite limited. As some of the indices listed above suggest, Likert's instrument is designed to be used in larger schools with more hierarchical structure. Because of this factor, the Likert instrument was selected for use in this research.

The central question for the purpose of this paper is what studies using the OCDQ and the Profile of a School have shown about school climate and planned change. Theory suggests that open climates and System 4 organizations should be more innovative and receptive to change. Research has partly shown this to be true, though the results are not clear and convincing. Thomas (1976) reports on several studies which used the OCDQ to study innovativeness:

> Recker (1968) noted the relationship between the openness of organizational climate in secondary schools with teachers' 'readiness to change'; . . . Hughes (1968), in an extension of his earlier study (1965), noted that the openness of climate of central offices was related to school district innovativeness. Peach (1967), however, observed a significant relationship between autonomous climate and innovativeness. Bennett (1968) noted such a relationship between the autonomous climate and both the total number of innovations and the curricular innovations adopted. The controlled climate was related negatively to those two measures of innovativeness. (pp. 454-455)

Marcum (1968) compared the climates of 10 schools in a 5-state area selected as most innovative with 10 identified as least innovative through an innovation checklist. He found significant differences between the mean climate scores. In addition, he found that those schools using innovative practices generally had open climates and those not as innovative had closed climates. Marcum found a significant difference between teachers' perceptions and administrators' perceptions of climate in innovative schools, but he did not find a corresponding difference in the noninnovative schools.

Helsel, Aurbach, and Willower (1969) used the OCDQ to test their hypothesis that teachers who perceived the climate as relatively open would estimate desirable change as possible. This major hypothesis was not supported, though the authors did discover significant relationships between aspects of principal behavior and expectations of successful change. Reynoldson (Note 5) used the OCDQ as part of his study of the relationships between the decision-making processes and innovativeness of public schools. He surveyed 52 schools in 4 states which had been identified as innovative. Reynoldson found a statistically significant relationship

between organizational climate scores and innovativeness and statistically significant differences in innovativeness between schools with open climates and schools with closed climates. He concluded, "The openness of organizational climate appears to be an important variable to consider in attempting to establish an environment conducive to the adoption of educational innovations" (p. 39). Finally, Paul (1977) reported the following as a generalization that can be made from studies of change: "An open organizational climate may facilitate the introduction and use of an innovation, but it does not assure introduction and use" (p. 44). Paul contends that results from the OCDQ do not sufficiently explain the variance among organizations in the extent of change.

Studies using the Profile of a School are not as readily available. A publication by Rensis Likert Association, Inc. (Note 6) reports the findings from 40 studies which used the Profile of a School. Several concern management and change.

Gehrman (1970) compared five innovative and five noninnovative high schools. He found a statistically significant difference in the climates of the two groups as perceived by students, but he also concluded that the difference is not practically significant and "is most probably due to an N of 609 rather than a practical significance in perception by students of the organizational climate of their high schools" (p. 84). No statistically significant difference was found in the teachers' perceptions of climate. The mean scores on the six subparts of the Likert questionnaire for the two groups of schools indicate both groups can be described as having System 3 climates by both students and teachers.

Wiener (1972) compared six innovative and six noninnovative schools

from three districts in New York state to test the relationship between the degree of openness of an organization and successful adoption of innovations. No significant difference was found between the climates of the innovative and noninnovative schools as measured by the Likert Profile of a School--Form T. Again, the profiles for all 12 schools in the study showed the schools to be predominantly System 3 organizations: "Although profiles differ between individual schools, the factor and overall profile means indicate a basic similarity among the schools studied" (p. 110). Wiener suggests that the procedure used to identify the schools in his study may have reduced the variance between the innovative and noninnovative schools, but Wiener's results are consistent with other studies which identify schools as predominantly System 3 organizations.

Ladouceur (Note 7) sampled 8 secondary schools and 42 elementary schools. All his major hypotheses were supported. The results showed a significant relationship between the management profile of a school and the climate for change, teachers' innovative activity and orientation, and quantitative and qualitative change capacities. Stepwise regression showed that "management profile accounted for 28% of the variance in qualitative change capacity and 35% of the variance in change climate" (p. 162). The best predictors of school change capacity were management profile (4.6%), teachers' innovative orientation (4.0%), years at the same school (2.8%), change climate (2.6%), sex (1.6%), and grade level of teaching (1.2%) for a total of 16.8% of the variance (p. 171). However, Ladouceur cautioned that his results are based upon data obtained by survey research from one school district and that replication

is needed before the results can be generalized.

Finally, Gauthier's study (1975) of 34 elementary IGE schools and 25 non-IGE schools in Connecticut found no difference between the groups in the ways teachers saw the principals' leadership and reacted to it. One focus of Gauthier's study was to determine whether the multiunit school (MUS) component of IGE produces a more participative climate than the more traditional structure of non-IGE schools. Gauthier's results did not support such a relationship:

> Surprisingly, the MUS organizational component had a slight negative relationship with facilitative school climate (r = -.0261). Schools which had been using the MUS structure for at least one year did not display a more participative climate than schools not employing the MUS component. (p. 106)

Although the three schools in Gauthier's study with the highest scores were IGE schools and the three with the lowest scores were non-IGE schools, all the schools in the study fell within the System 3, Consultive, profile on all the subscales and on total mean scores.

Taken together the above studies do not present a clear picture of the relationships between school climate and change. However, one would expect that schools using an educational innovation such as IGE would have relatively open climates and that the climates of schools in various stages of the change process would differ. (See Barrows et al., Note 2, for a complete description of various models of the change process and an alternative model proposed as more appropriate to the 10 schools in the project sample.) One would also expect that a given school's climate would change over time. These are relationships that this research was conducted to assess.

Participant Information

A total of 49 teachers participated in this study. Each teacher was a full-time employee in an IGE school located in Wisconsin. All teachers were part of an IGE teaching unit within a school which used the curricular products developed by the Wisconsin Research and Development Center.

In total, 10 schools were sampled. The number of teachers within an IGE unit ranged from 3 to 6 across the 10 schools. A complete breakdown of the unit size by school can be found in Table 1.

The typical teacher in the sample is a female, approximately 36 years old, having a baccalaureate degree and 10 years of teaching experience. The average teaching experience in an IGE school was approximately 4 years. A complete breakdown of the demographic variables can be found in Tables 2 through 4.

Instrumentation

Likert's Profile of a School, Form 3 (Likert & Likert, 1977), was modified for the purpose of this study. One modification consisted of changing the language of the original instrument to reflect the characteristics of the multiunit IGE schools employed in the study. This modification was accomplished by incorporating the role of unit leader within the instrument. Another modification of the original instrument was to delete those items which specifically addressed the competence of the principal and those items which reflected the climate of student-teacher interaction.

The modifications described above yielded a final instrument of 59 items rather than the 93 items which comprised Likert's original instrument.

Table 1

School by IGE Unit Size (number of teachers)

	Unit size
School 01	6
School 02	6
School 03	6
School 04	5
School 05	3
School 06	6
School 07	5
School 08	4
School 09	5
School 10	3
Total	49

Table 2

Breakdown of Participant Sample by Sex

Code	Absolute frequency	Relative frequency (percent)	Adjusted frequency (percent)	Cummulative frequency (percent)
Male	12	24.5	25.0	25.0
Female	36	73.5	75.0	100.0
Missing	1	2.0	Missing	100.0
Total	49	100.0	100.0	

Table 3

Academic Attainment of the Sample

Code	Absolute frequency	Relative frequency (percent)	Adjusted frequency (percent)	Cummulative frequency (percent)
Baccalaureate	35	71.4	72.9	72.9
Master	9	18.4	18.8	91.7
Master plus	4	8.2	8.3	100.0
Missing data	1	2.0	Missing	100.0
Total	49	100.0	100.0	

Table 4

Other Demographic Information

	n	Mean	SD	Range
Age	49	36.3	1.53	23-58
Teaching experience	49	10.8	1.56	2-39
IGE experience	49	3.8	.39	1-10

The format of the final instrument consists of four anchors for each question. Two options within each anchor reflect the degree of agreement with a specific anchor. A complete copy of the instrument can be found in Appendix A.

Even though the literature contains approximately 40 studies addressing the psychometric qualities of the Profile of a School (Likert, 1978), an internal consistency check was performed for the modified instrument. A coefficient Alpha of 0.6 was obtained for the modified instrument.

Procedure

Since the climate data was collected as part of a larger research thrust being conducted through the Wisconsin Research and Development Center for Individualized Schooling, on-site visits were made by Center personnel during the duration of the study. It was during these visits that Center personnel administered the modified climate instruments to the units of teachers who volunteered to take part in the study.

All participants within each school were given the modified climate instrument collectively both in fall, 1978, and spring, 1979. While the persons responsible for administering the instrument varied from school to school, all personnel were employees of the Research and Development Center. Furthermore, the same set of standardized instructions were followed for the administration of the instrument.

Design

The primary purpose of this study is to examine the perceptions of school climate by teachers who are experiencing an innovative change within a school. Within 10 specific schools teachers' perceptions of

their school's climate were sampled at two separate points in time. In order to assess any possible change in the teachers' perceptions while experiencing the innovation, a two-factor design with repeated measures was employed (Winer, 1971). The variable of teachers was nested within schools while crossed with time. A diagram of the design is displayed in Figure 1.

Results

The dependent variable for this study is school climate. The school climate variable was operationally defined by a composite score on the modified climate instrument. The composite climate score for each teacher was calculated by summing the individual teacher's responses to the 59 items. The higher the derived composite score, the more open the teacher perceives the school's climate to be. A breakdown of the mean composite climate scores by schools for both Time 1 and Time 2 can be found in Table 5.

The data contained in Table 5 were further analyzed by analysis of variance. The specific effort tested with the analysis of variance procedure was time. The results of the statistical test can be found in Table 6.

An examination of Table 6 indicates that a systematic difference is detected between the teachers' perception of climate within a school for Time 1 and Time 2. Since there are only two time periods in the present study, an examination of the overall means for each time period found in Table 5 indicates the direction of the difference. On the average the teachers within a school perceived the school as becoming

		Time 1	Time 2
School 01	Teacher 1 Teacher n	n = 6	n = 6
School 02	Teacher 1 Teacher n	n = 6	n = 6
School 03	Teacher 1 Teacher n	n = 6	n = 6
School 04	Teacher 1 Teacher n	n = 5	n = 5
School 05	Teacher 1 Teacher n	n = 3	n = 3
School 06	Teacher 1 Teacher n	n = 6	n = 6
School 07	Teacher 1 Teacher n	n = 5	n = 5
School 08	Teacher 1 Teacher n	n = 4	n = 4
School 09	Teacher 1 Teacher n	n = 5	n = 5
School 10	Teacher 1 Teacher n	n = 3	n = 3

Figure 1. Design of the study.

Table 5

Average Composite Climate Score by School and Time

	Time 1	Time 2
School 01	312.50	324.83
School 02	333.50	308.16
School 03	315.67	314.16
School 04	309.40	334.60
School 05	228.33	226.00
School 06	288.33	316.83
School 07	358.40	361.60
School 08	300.25	313.25
School 09	308.60	328.80
School 10	295.00	304.33
Mean	304.99	313.25

Table 6

Analysis of Variance

Source of variation	DF	SS	F	Probability
Time	1	1,632.65	5.02	.03
Time x Teachers (School)	39	12,438.10		

more open during the duration of the innovation over the specific time periods sampled.

Not only was the absolute magnitude of the overall means different for Time 1 and Time 2, but teachers as a whole in 7 of the 10 schools perceived the school as becoming more open. Of the three schools that reflected a decrease in the climate scores from the first administration, only one school reflected a substantial decrease. The substantial decrease of School 02 can be observed in Table 5.

In view of the significant main effect for time found in Table 6, these data were further probed by a stepwise regression. The length of time the teacher had been employed in the current school, the number of years the teacher had taught in general, the number of years the teacher had taught in IGE schools, and the teacher's educational attainment were regressed with the change in school climate from Time 1 to Time 2. The results of the stepwise regression analysis can be found in Table 7.

Table 7 indicates that a significant amount of the variance in the change in perceptions of the teachers between Time 1 and Time 2 can be accounted for by two of the demographic variables. The two specific variables accounting for the variance were the amount of teaching experience a teacher had with IGE and the length of time a teacher had been employed within the present IGE school. The summary statistics for the regression analysis can be found in Table 8.

An examination of Table 8 suggests that, of the two variables entering the regression equation, the amount of experience with IGE is more important. The less experience a teacher has with IGE, the less open the teacher is likely to perceive the school climate. The second

Table 7

Stepwise Regression Analysis for Change in Climate with Selected Demographic Variables

	DF	SS	F	Probability
Regression	2	5,422.28	5.40	0.0089
Error	36	18,066.08		

Table 8

Summary for Stepwise Regression Analysis

	Coefficients	Standard error	Cumulative R square
Intercept	6.85		
Experience with IGE	-4.62	1.48	.146
Length of time in present school	1.55	.77	.231

variable in the equation, which relates to the length of time the teacher has been employed in the present school, indicates that the longer a teacher has been employed within a school, the less open the teacher would perceive the school as being. Together, both of these variables account for 23% of the variance in the perceived change in school climate.

Conclusions

Review of the literature addressing school climate and change produced some conflicting results. Studies by Reynoldson (1969), Marcum (1968), and Ladouceur (1973) suggest that a relationship between school climate and change exist. Other studies by Wiener (1972), Gehrman (1970), Gauthier (1975), and Helsel et al. (1969) fail to support a relationship between these variables. The results of this study are more aligned with Reynoldson, Marcum, and Ladouceur.

An examination of the designs employed in the studies may, in part, help resolve some of the lack of agreement among the studies. Reynoldson (1969) employed a correlational design that examined the covariation of school climate and perceived innovativeness of a school. Ladouceur (1973) also employed a correlational design that examined the relationship between school climate and capacity to change. Both of these designs took into consideration each teacher's perceptions rather than the aggregated perceptions of a group.

Marcum's (1968) design, on the other hand, employed aggregated data. However, by the nature of his design he sampled groups that fell at both ends of the continuum relating to innovativeness. This method of sampling optimized the differentiation between the two groups in terms of their perceived school climate.

Those studies which did not detect a relationship between school climate and change employed aggregated data in designs similar to Marcum's study (Hadsel et al., 1970; Gauthier, 1975; Gehrman, 1970; Wiener, 1972). However, in these studies the manipulation of innovative versus noninnovative schools (Gehrman, 1970; Wiener, 1970), IGE versus non-IGE schools (Gauthier, 1975), and high degree of possible change versus low degree of possible change was not as stringent as Marcum's manipulation. The actual samples in these studies were purposive rather than the extreme ends of a continuum. Consequently, it is not surprising that a difference was not detected since these studies failed to consider any changes in climate within a school.

Results from this research show effects of time on climate in two different directions. The significant main effect for time reported in Table 6 suggests that the climates of schools in this study were perceived as increasingly more open over the duration of the study. The stepwise regression analysis in Table 8 shows that teachers with more experience in IGE schools tend to perceive school climate as more open while teachers who have been employed longer in a particular school tend to perceive the climate as less open. It is difficult to formulate conclusions from these three findings together. Though they appear to be contradictory, it must be remembered that the unit of analysis for the first is the teaching unit and the unit of analysis for the second and third is the teacher. Unit sizes and experience levels of teachers vary from school to school and also make the data difficult to interpret. However, the three findings together do indicate that the analysis of climate in reference to time may be a profitable area for future research.

Several limitations of this study make generalizing from the findings inadvisable. A nonrepresentative sample of IGE schools in Wisconsin was used in the research. Small samples were used to represent some schools in the study, and climate measures were collected only twice. Instrumentation may also have had an effect. The impact of modifying the Likert instrument cannot be known, and the results are based on a gross composite score which may be relatively insensitive to factors affecting climate in an unsystematic way. Therefore, the findings of this study are only suggestive.

However, the findings of the project Studies on Implementation and several other analyses of innovations referenced in project publications (Barrows et al., Note 2; Klenke & Barrows, Note 3) indicate that change is phasic and that schools that adopt innovations are likely to move through a number of stages, though these stages may not be linear or the same for all organizations. This study suggests that using a school as its own control may prove a more profitable method of research on climate than previous approaches which have used climate measures to distinguish between schools or have used post hoc collection of data to attempt to formulate predictions about the receptivity of particular school organizational types to innovation. Using a valid measure of organizational climate and a school as its own control would allow researchers to monitor changes in a particular school or set of schools over the life of an innovation without reference to a model of change that is descriptive of the process for all educational institutions.

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APPENDIX A

WISCONSIN RESEARCH AND DEVELOPMENT CENTER FOR INDIVIDUALIZED SCHOOLING

UNIVERSITY OF WISCONSIN - MADISON SCHOOL OF EDUCATION
1025 W Johnson Street Madison, Wisconsin 53706 (608) 263-4200

PROFILE OF A SCHOOL

INSTRUCTIONS

1. Each question has eight possible responses. Please answer by filling in one of the numbered circles on the answer sheet. *For example, suppose that the question were:*

How often does the sun shine in your town?	RARELY		SOMETIMES		OFTEN		VERY OFTEN	
	①	②	③	④	⑤	⑥	⑦	⑧

If you think that the sun shines "often," you would fill in circle ⑤ or ⑥. You would fill in ⑤ if you feel that the situation is closer to "sometimes." you would fill in ⑥ if you feel that the situation is closer to "very often."

2. When questions are asked about teachers or students in general, answer the questions to describe the average situation or reaction. If you do not find an answer to exactly fit your needs, use the one that is closest to it. If the question is not applicable to your situation, please omit answering that question.

(BEGIN ON PAGE 2)

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1.	To what extent do you look forward to your teaching day?	VERY LITTLE ① ②	SOME ③ ④	CONSIDERABLE ⑤ ⑥	VERY GREAT ⑦ ⑧
2.	How often do you see the principal's behavior as friendly and supportive?	RARELY ① ②	SOME-TIMES ③ ④	OFTEN ⑤ ⑥	VERY OFTEN ⑦ ⑧
3.	How much confidence and trust does the principal have in you?	VERY LITTLE ① ②	SOME ③ ④	QUITE A BIT ⑤ ⑥	VERY GREAT ⑦ ⑧
4.	How much confidence and trust do you have in the principal?	① ②	③ ④	⑤ ⑥	⑦ ⑧
5.	How free do you feel to talk to the principal about school matters?	NOT FREE ① ②	SOMEWHAT FREE ③ ④	QUITE FREE ⑤ ⑥	VERY FREE ⑦ ⑧
6.	How often do you try to be friendly and supportive to:	RARELY	SOME-TIMES	OFTEN	VERY OFTEN
	a. the principal	① ②	③ ④	⑤ ⑥	⑦ ⑧
	b. other teachers	① ②	③ ④	⑤ ⑥	⑦ ⑧
7.	How often does the principal seek and use your ideas about:				
	a. academic matters	① ②	③ ④	⑤ ⑥	⑦ ⑧
	b. non-academic school matters	① ②	③ ④	⑤ ⑥	⑦ ⑧
8.	In your job, is it worthwhile or a waste of time to do your best?	USUALLY A WASTE OF TIME ① ②	SOMETIMES A WASTE OF TIME ③ ④	OFTEN WORTH-WHILE ⑤ ⑥	ALMOST ALWAYS WORTHWHILE ⑦ ⑧
9.	How much influence do the following have on what goes on in your school?	VERY LITTLE	SOME	QUITE A BIT	VERY GREAT
	a. principal	① ②	③ ④	⑤ ⑥	⑦ ⑧
	b. teachers	① ②	③ ④	⑤ ⑥	⑦ ⑧

10.	How much influence do you think the following should have on what goes on in your school?	VERY LITTLE	SOME	QUITE A BIT	VERY GREAT
	a. principal	① ②	③ ④	⑤ ⑥	⑦ ⑧
	b. teachers	① ②	③ ④	⑤ ⑥	⑦ ⑧
11.	How much do you feel that the principal is interested in your success as a teacher?	① ②	③ ④	⑤ ⑥	⑦ ⑧
12.	To what extent does the principal make sure that planning and setting priorities are done well?	VERY LITTLE ① ②	SOME ③ ④	CONSIDERABLE ⑤ ⑥	VERY GREAT ⑦ ⑧
13.	To what extent does the principal try to provide you with the materials, equipment and space you need to do your job well?	① ②	③ ④	⑤ ⑥	⑦ ⑧
14.	To what extent does the principal give you useful information and ideas?	① ②	③ ④	⑤ ⑥	⑦ ⑧
15.	To what extent are you encouraged to be innovative in developing more effective and efficient educational practices?	① ②	③ ④	⑤ ⑥	⑦ ⑧
16.	How satisfying is your work at your school?	NOT SATISFYING ① ②	SOMEWHAT SATISFYING ③ ④	QUITE SATISFYING ⑤ ⑥	SATISFYING ⑦ ⑧
17.	What is the direction of the flow of information about academic and non-academic school matters?	FROM THE TOP DOWN ① ②	MOSTLY DOWN ③ ④	DOWN AND UP ⑤ ⑥	DOWN, UP & LATERALLY ⑦ ⑧

18.	How do you view communications from the principal?	VIEWED WITH GREAT SUSPICION ① ②	SOME VIEWED WITH SUSPICION, SOME WITH TRUST ③ ④	USUALLY VIEWED WITH TRUST ⑤ ⑥	ALMOST ALWAYS VIEWED WITH TRUST ⑦ ⑧
19.	How accurate is upward communication to the principal?	USUALLY INACCURATE ① ②	OFTEN INACCUATE ③ ④	FAIRLY ACCURATE ⑤ ⑥	ALMOST ALWAYS ACCURATE ⑦ ⑧
20.	How well does the principal know the problems faced by the teachers?	NOT WELL ① ②	SOMEWHAT WELL ③ ④	QUITE WELL ⑤ ⑥	VERY WELL ⑦ ⑧
21.	To what extent is communication open and candid:	VERY LITTLE	SOME	CONSIDERABLE	VERY GREAT
	a. between principal and teachers	① ②	③ ④	⑤ ⑥	⑦ ⑧
	b. among teachers	① ②	③ ④	⑤ ⑥	⑦ ⑧
22.	In your school, how are conflicts between units usually resolved?	USUALLY IGNORED ① ②	APPEALED BUT NOT RESOLVED ③ ④	RESOLVED BY PRINCIPAL ⑤ ⑥	RESOLVED BY ALL THOSE AFFECTED ⑦ ⑧
23.	How much do teachers in your school encourage each other to do their best?	VERY LITTLE ① ②	SOME ③ ④	QUITE A BIT ⑤ ⑥	VERY GREAT ⑦ ⑧
24.	In your school, do principals, teachers, and students work only for themselves or do they work as a team?	EVERY PERSON FOR THEMSELF ① ②	LITTLE COOPERATIVE TEAMWORK ③ ④	A MODERATE AMOUNT OF COOPERATIVE TEAMWORK ⑤ ⑥	A VERY GREAT AMOUNT OF COOPERATIVE TEAMWORK ⑦ ⑧
25.	How much do different units plan together and coordinate their efforts?	VERY LITTLE ① ②	SOME ③ ④	QUITE A BIT ⑤ ⑥	VERY GREAT ⑦ ⑧

26.	Are decisions made at the best levels for effective performance?	AT MUCH TOO HIGH LEVELS ① ②	AT SOMEWHAT TOO HIGH LEVELS ③ ④	AT QUITE SATISFACTORY LEVELS ⑤ ⑥	AT THE BEST LEVELS ⑦ ⑧
27.	How adequate are the supplies and equipment the school has?	INADEQUATE ① ②	SOMEWHAT INADEQUATE ③ ④	QUITE ADEQUATE ⑤ ⑥	VERY ADEQUATE ⑦ ⑧
28.	To what extent are you involved in major decisions related to your work?	VERY LITTLE ① ②	SOME ③ ④	CONSIDERABLE ⑤ ⑥	VERY GREAT ⑦ ⑧
29.	How much does the principal try to help you with your problems?	VERY LITTLE ① ②	SOME ③ ④	QUITE A BIT ⑤ ⑥	VERY GREAT ⑦ ⑧
30.	To what extent are decision makers aware of problems, particularly at lower levels?	VERY LITTLE ① ②	SOME ③ ④	CONSIDERABLE ⑤ ⑥	VERY GREAT ⑦ ⑧
31.	What is the administrative style of the principal?	HIGHLY AUTHORITARIAN ① ②	SOMEWHAT AUTHORITARIAN ③ ④	CONSULTATIVE ⑤ ⑥	PARTICIPATIVE GROUP ⑦ ⑧
32.	How high are the principal's goals for educational performance?	LOW ① ②	ABOUT AVERAGE ③ ④	QUITE HIGH ⑤ ⑥	VERY HIGH ⑦ ⑧
33.	To what extent do the following feel responsible for seeing that educational excellence is achieved in your school?	VERY LITTLE ① ②	SOME ③ ④	CONSIDERABLE ⑤ ⑥	VERY GREAT ⑦ ⑧
	a. principal	① ②	③ ④	⑤ ⑥	⑦ ⑧
	b. unit leaders	① ②	③ ④	⑤ ⑥	⑦ ⑧
	c. teachers	① ②	③ ④	⑤ ⑥	⑦ ⑧

TO UNIT LEADERS: Please skip questions 34-51 and go on to the next questionnaire which begins on page 8.

TO TEACHERS: Please answer the following questions (34-51) concerning the unit structure.

34.	How often is your unit leader friendly and supportive?	RARELY (1) (2)	SOMETIMES (3) (4)	OFTEN (5) (6)	VERY OFTEN (7) (8)
35.	How much confidence and trust do you have in your unit leader?	VERY LITTLE (1) (2)	SOME (3) (4)	QUITE A BIT (5) (6)	VERY GREAT (7) (8)
36.	How much confidence and trust does your unit leader have in you?	(1) (2)	(3) (4)	(5) (6)	(7) (8)
37.	How free do you feel to talk to your unit leader about matters related to your work?	NOT FREE (1) (2)	SOMEWHAT FREE (3) (4)	QUITE FREE (5) (6)	VERY FREE (7) (8)
38.	How often does your unit leader seek and use your ideas about:	RARELY	SOMETIMES	OFTEN	VERY OFTEN
	a. academic matters	(1) (2)	(3) (4)	(5) (6)	(7) (8)
	b. non-academic school matters	(1) (2)	(3) (4)	(5) (6)	(7) (8)
39.	How much influence do unit leaders have on what goes on in your school?	VERY LITTLE (1) (2)	SOME (3) (4)	QUITE A BIT (5) (6)	VERY GREAT (7) (8)
40.	How much influence do you think your unit leader should have on what goes on in your school?	(1) (2)	(3) (4)	(5) (6)	(7) (8)
41.	How much do you feel that your unit leader is interested in your success as a teacher?	(1) (2)	(3) (4)	(5) (6)	(7) (8)
42.	How often does your unit leader use departmental meetings to solve problems?	RARELY (1) (2)	SOMETIMES (3) (4)	OFTEN (5) (6)	VERY OFTEN (7) (8)
43.	To what extent does your unit leader make sure that planning and setting priorities are done well?	VERY LITTLE (1) (2)	SOME (3) (4)	CONSIDERABLE (5) (6)	VERY GREAT (7) (8)
44.	To what extent does your unit leader give you useful information and ideas?	(1) (2)	(3) (4)	(5) (6)	(7) (8)

45.	How do you view communications from your unit leader?	VIEWED WITH GREAT SUSPICION ① ②	SOME VIEWED WITH SUSPICION, SOME WITH TRUST ③ ④	USUALLY VIEWED WITH TRUST ⑤ ⑥	ALMOST ALWAYS VIEWED WITH TRUST ⑦ ⑧
46.	How well does your unit leader know the problems you face?	NOT WELL ① ②	SOMEWHAT WELL ③ ④	QUITE WELL ⑤ ⑥	VERY WELL ⑦ ⑧
47.	How much interaction is there between the unit leader and teachers in your unit?	VERY LITTLE ① ②	SOME ③ ④	QUITE A BIT ⑤ ⑥	VERY GREAT ⑦ ⑧
48.	To what extent is communication open and candid between the unit leader and teachers in your unit?	VERY LITTLE ① ②	SOME ③ ④	CONSIDERABLE ⑤ ⑥	VERY GREAT ⑦ ⑧
49.	To what extent does your unit leader involve you in major decisions related to your work?	① ②	③ ④	⑤ ⑥	⑦ ⑧
50.	How much does your unit leader help you with your problems?	VERY LITTLE ① ②	SOME ③ ④	QUITE A BIT ⑤ ⑥	VERY GREAT ⑦ ⑧
51.	How high are the goals of your unit leader for educational performance?	LOW ① ②	ABOUT AVERAGE ③ ④	QUITE HIGH ⑤ ⑥	VERY HIGH ⑦ ⑧

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